

1-D Kinematics Practice Problems

1. When Maggie applies the brakes of her car, the car slows uniformly from 15.0 m/s to 0.0 m/s in 2.50 s. How many meters before a stop sign must she apply her brakes in order to stop at the sign? [18.8 m]
2. A driver in a car traveling at a speed of 21.8 m/s sees a cat 101 m away on the road. How long will it take for the car to accelerate uniformly to a stop in exactly 99 m? [9.1 s]
3. A car starts from rest and travels for 5.0 s with a constant acceleration of -1.5 m/s/s. What is the final velocity of the car? How far does the car travel in this time interval? [-7.5 m/s; 19 m]
4. A driver of a car traveling at 15.0 m/s applies the brakes, causing a uniform acceleration of -2.0 m/s/s. How long does it take the car to accelerate to a final speed of 10.0 m/s? How far has the car moved during the braking period? [2.5 s; 32 m]
5. A flowerpot falls from a windowsill 25.0 m above the sidewalk.
 - a. How fast is the flowerpot moving when it strikes the ground? [22.1 m/s]
 - b. How much time does a passerby on the sidewalk below have to move out of the way before the flowerpot hit the ground? [2.25 s]
6. A worker drops a wrench from the top of a tower 80.0 m tall. What is the velocity when the wrench strikes the ground? [-39.6 m/s]
7. [Challenge] A rocket moves upward, starting from rest with an acceleration of +29.4 m/s/s for 3.98 s. It runs out of fuel at the end of the 3.98 s but does not stop. How high does it rise above the ground? [931 m]